

S/N 10/559,908

In response to the Office Action dated June 22, 2010

REMARKS

Favorable reconsideration of this application is requested in view of the above amendments and the following remarks.

Claim 14 has been amended and is supported in the specification at, for example, paragraphs [0053] and [0057]. Claims 23 and 24 are directed to a method and a recording medium with features corresponding to claim 14. Claims 23 and 24 are supported in the specification at, for example, paragraphs [0053] and [0057]. Claims 12 and 13 have been canceled without prejudice or disclaimer. Claims 15, 16 and 22 have been amended editorially. No new matter is added.

35 USC § 102 Rejections

Claims 12-15 and 22 have been rejected under 35 USC 102(b) as being anticipated by Russell (US 6,327,679). Applicants respectfully traverse the rejection.

Claim 14 is directed to an information recording device for recording information on an information recording medium having a defect management information area for recording defect management information used for managing the defective area. The defect management information contains a plurality of defect list entries. Each defect list entry contains fields that store defect location information indicating a location of the defective area, substitute position information indicating a location of the substitute area, and defect status information indicating an attribute of the defect list entry. An initialization processing module maintains at least the defect location information of the defect management information and overwrites the defect status information with an attribute indicating that significant user data is not present in any of the defective area and the substitute area, in each defect list entry for which defect management has been conducted upon receiving an execution instruction of a physical reformatting of the information recording medium.

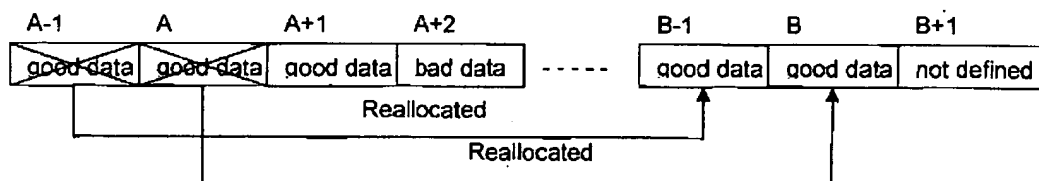
The claimed invention thus sets a flag, in the status field, when reformatting and clears the flag when data is written. A set flag indicates that significant data is not recorded on either of the defective area or replacement area, i.e., it is not necessary to read the data because it is meaningless to the host and has no influence on the host. Even

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if the data is not "bad", it still need not be read by the host. When the information recording device receives a command from the host to reformat the information recording medium, the defect status information fields of all the defect list entries are set regardless of any data that is recorded during the reformatting process. And, when the information recording device receives a command from the host to write data to an area on the information recording medium, the defect status information field of the corresponding defect list entry is cleared. The difference is thereby recognized between reformatting and writing. The effect of this is that a Read-Modify-Write problem in the defective area is avoided on a block marked by the status field and a read error is never generated for the read process. This is illustrated below.

In the initial state, the good data in logical block numbers (LBN) A-1 and A, which are defective, are reallocated to LBN's B-1 and B, the replacement blocks, as shown below.



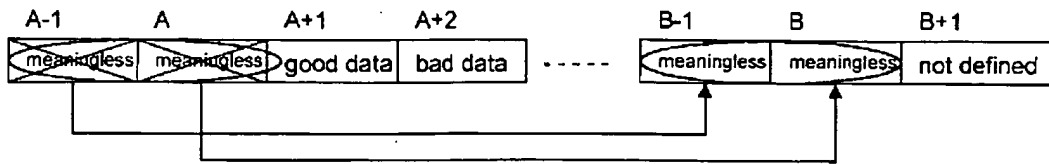
Upon reallocation the status field is cleared, meaning that this field is not used. Thus resulting in a defect map table as illustrated below.

Failed LBN	Replacement LBN	Status Field
A-1	B-1	Cleared
A	B	Cleared

The information recording device reformats the information recording medium and the defective blocks, A-1 and A, and the replacement blocks, B-1 and B, include no significant data, i.e. any data that is there is now meaningless (whether "good" or "bad"), and it is not necessary to read out the data, as shown below. Thus, a read error is not returned and the fabricated data may be returned for subsequent reads for LBN's A-1 and A.

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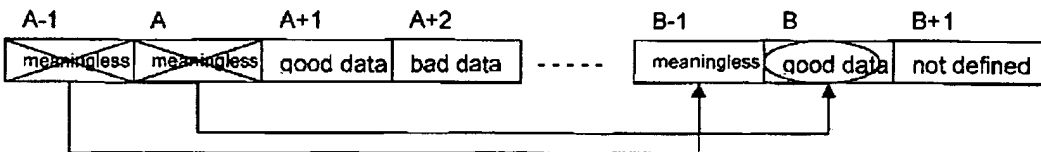
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Upon reformatting the status field is set, meaning that no significant data is recorded on either the failed LBN or the replacement LBN and it is not necessary to read the data. The defect table now appears as illustrated below.

Failed LBN	Replacement LBN	Status Field
A-1	B-1	Set
A	B	Set

Upon a write request to LBN A, the data to be written to LBN A is recorded to B, if LBN A is still defective. Consequently, the data on B becomes good data, as shown below. The data on B is returned for subsequent reads for LBN A. Fabricated data may still be returned for subsequent reads for LBN A-1.



Upon writing, the status field in the corresponding defect entry is cleared so that the defect table now appears as follows.

Failed LBN	Replacement LBN	Status Field
A-1	B-1	Set
A	B	Cleared

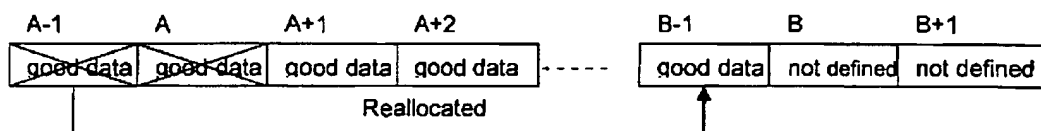
Russell discloses that the unusable bit is set upon read reallocation or cleared during reformatting or writing. If the bit is set, it is an indication that the data in the replacement sector is bad data and is unusable. If the bit is cleared, it is an indication that the data in the replacement sector is good data and is useable. Thus, the bit is set when a

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new defect entry is registered during reading and the bit is cleared when good data is written to the defective sector through writing or reformatting. Russell cannot recognize the difference between reformatting and rewriting. The effect of this is that a Read-Modify-Write problem cannot be avoided on a block marked by the unusable bit and a read error must be generated for the read process.

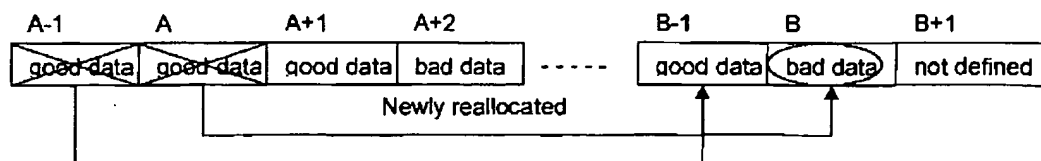
In Russell's initial state, good data resides in logical block numbers (LBN) A-1 and A, which are defective. The good data of LBN A-1 has been reallocated to LBN B-1 but LBN A is not readable due to the defect, as shown below.



Upon reallocation the unusable bit is cleared, meaning that the data on replacement LBN B-1 is useable, that it is good data. Thus resulting in a defect map table as illustrated below.

Failed LBN	Replacement LBN	Unusable Bit
A-1	B-1	Cleared
-	-	-

As shown below, Russell then reads LBN A (Fig. 3, step 312) and a read error is generated for subsequent reads unless the corresponding unusable bit is cleared (Fig. 4A, steps 406 and 408). The sector LBN A is identified as a defective sector and the data is reallocated from LBN A to LBN B. LBN A and B are listed in the defect map table as a failed LBN and replacement LBN, respectively, and an error is reported. The unusable bit is set which means that the data on replacement LBN B is unusable since it is bad data.

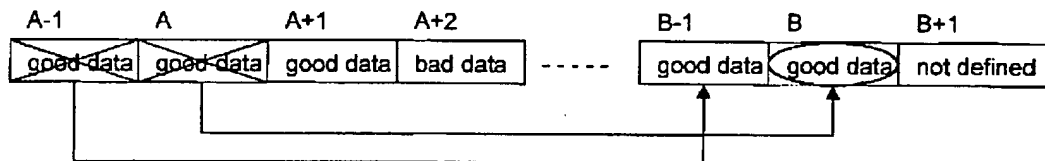


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Failed LBN	Replacement LBN	Unusable Bit
A-1	B-1	Cleared
A	B	Set

Russell then attempts to write to or reformat LBN A (Fig. 4B, steps 424 and 426 and col. 5, lines 3-6). The data requested to be written to LBN A is written to LBN B based on the entry of the defect map table. Then, the unusable bit in the entry that corresponds to LBN A is cleared because the data on LBN B is good to be read. The data recorded on LBN B is returned for subsequent reads for LBN A.



Failed LBN	Replacement LBN	Unusable Bit
A-1	B-1	Cleared
A	B	Cleared

Therefore, as detailed, there are differences between the unusable bit of Russell and the status field of the present invention. In summary, setting the unusable bit in Russell means that bad data is recorded on the replacement sector while setting the status field in the current invention means no significant data is recorded on any of the defective area and the replacement area as is claimed. Russell does not teach or suggest the features of claim 14. Accordingly, this rejection should be withdrawn.

Claim 23, which recites a process for recording the attribute of the defect status information after physical reformatting of the information recording medium, is distinguished from Russell for at least the same reasons as discussed for claim 14 above and claim 23 should be allowable.

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Claim 24, which recites an information recording medium comprising a volume space for recording user data, a spare area containing a substitute area that can be used in place of a defective area contained in the volume space, and a defect management information area for recording defect management information used for managing the defective area, is distinguished from Russell for at least the same reasons as discussed for claim 14 above and claim 24 should be allowable.

Claims 15 and 22, which depend from claim 14, are allowable at least by virtue of their dependence on independent claim 14. The rejection of these dependent claims should be withdrawn. Applicant does not concede the correctness of the rejection.

The rejection of claims 12-13 are moot due to the cancellation of the claims. The rejection of these claims should be withdrawn. Applicant does not concede the correctness of the rejection.

35 USC § 103 Rejections

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Russell (US 6,327,679) in view of Kulakowski (US 5,303,219). Applicant respectfully traverses this rejection.

Claim 16 is allowable at least by virtue of its dependence on independent claim 14. And, the deficiencies of Russell are not remedied by Kulakowski. The rejection of this dependent claim should be withdrawn. Applicant does not concede the correctness of the rejection.

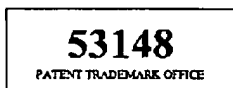
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Applicants respectfully request that a timely Notice of Allowance be issued in this case.

If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone the undersigned at the below-listed telephone number.



Dated: August 30, 2010

Respectfully submitted,

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